

CLAIMS AMENDMENTS AND CLAIM LISTING:

1. (Currently Amended) A device for applying non-penetrating clips to small blood vessels or other wound sites or tissue separation sites where suturing or other wound closure techniques would be impossible or undesirable, comprising:

a hand-held clip applier, including:

an elongated gripping handle suitable for gripping in the hand of a surgeon,

an elongated clip storing and dispensing stem, much narrower than the handle and rigidly extending and projecting forward from a forward end of the handle, the stem holding a plurality of clips and having a clip-applying tip at a remote end, the tip including means for dispensing and serially applying metal clips in non-penetrating engaging configuration against sections of tissue on either side of a wound or tissue separation to clamp the two sections of tissue together, upon the receipt of mechanical force to a clip-applying component of the stem,

a movable member within the handle which, when caused to move by a force applied from outside the handle, is effective to cause movement of the clip-applying component in the stem so as to cause dispensing and application of a clip from the tip at the remote end of the narrow stem, and

linkage means engaged with the movable member within the handle and extending to a position in the handle capable of receiving a pushing force from the exterior of the handle, and

a flexible cable release device comprising a cable sheath, and an internal cable capable of delivering a compressive pushing force through the sheath, a hand operable actuator at a remote hand-grippable end of the cable release, remote from the clip applier, for applying a pushing force to slide the cable through sheath so as to cause extension of a pusher tailpiece out of a proximal end of the cable sheath when the hand operable actuator is engaged, the sheath at the proximal end having means for connection to the handle of the hand-held clip applier in a position to apply force to the linkage means in the handle by motion of the pusher tailpiece, thus advancing the linkage means and movable member within the handle, and thus advancing the clip-applying component to dispense and apply a clip when the thumb button on the flexible cable release device is pushed, the cable sheath and internal cable being sufficiently flexible as to avoid movement of the tip when the hand operable actuator is moved to apply said pushing force,

whereby with the cable release device connected to the clip applier the hand-held clip applier can be held very steadily in one hand with its tip under the microscope while the force to

apply a clip is supplied at the remote end of the cable release device, avoiding any movement of the tip at the instant of clip application.

2. (Original) The device of claim 1, wherein the handle is round so as to be capable of comfortable hand gripping in any rotational orientation.

3. (Currently Amended) A device for applying non-penetrating clips to blood vessels or other wound sites or tissue separation sites where suturing or other wound closure techniques would be impossible or undesirable, comprising:

a hand-held clip applier, including:

an elongated gripping handle suitable for gripping in the hand of a surgeon,

an elongated clip storing and dispensing stem, much narrower than the handle and rigidly extending and projecting forward from a forward end of the handle, the stem holding a plurality of clips and having a clip-applying tip at a remote end, the tip including means for dispensing and serially applying metal clips in non-penetrating engaging configuration against sections of tissue on either side of a wound or tissue separation to clamp the two sections of tissue together, upon the receipt of force to a

clip-applying component of the stem,

a movable member within the handle which, when caused to move by a force applied from outside the handle, is effective to cause movement of the clip-applying component in the stem so as to cause dispensing and application of a clip from the tip at the remote end of the narrow stem, and

linkage means adjacent to the movable member within the handle and extending to a position in the handle capable of receiving a force from the exterior of the handle, and

a flexible remote force-transmitting device comprising a tubular sheath, and an internal movable medium capable of delivering a force through the tubular sheath, a remote actuator at a remote end of the flexible device, remote from the clip applier, for applying a force to slide the movable medium through the sheath so as to cause movement of a tailpiece at a proximal end of the tubular sheath when the remote actuator is engaged, the sheath at the proximal end being connected to the handle of the hand-held clip applier in a position to apply force to the linkage means in the handle by motion of the tailpiece, thus moving the linkage means and movable member within the handle, and thus advancing the clip-applying component to dispense and apply a clip when the remote actuator on the flexible force-transmitting device is engaged, the tubular sheath and

medium being sufficiently flexible as to avoid movement of the tip when the remote actuator is engaged and moved to apply said force,

whereby with the remote flexible force-transmitting device connected to the clip applier the hand-held clip applier can be held very steadily in one hand, and can be gripped at any location desired along the length of the handle, while the force to apply a clip is supplied at the remote end of the flexible device, avoiding any movement of the tip at the instant of clip application.

4. (Original) The device of claim 3, wherein the remote flexible force-transmitting device has a threaded fitting at its proximal end, the tail end of the handle of the clip applier having a mating thread so that the flexible device is removable from the clip applier.

5. (Previously Presented) The device of claim 4, wherein the flexible force-transmitting device comprises a cable release device, said movable medium comprising an internal cable in the tubular sheath and the actuator comprising a thumb button.

6. (Previously Presented) The device of claim 3, wherein the remote flexible force-transmitting device comprises a

hydraulic line containing liquid as said movable medium, and wherein the remote end of the flexible device has a piston and cylinder connected to put pressure on the liquid when the actuator is depressed, to force the liquid through the hydraulic tube, and said proximal end of the flexible device having a second piston and cylinder with the piston connected to said tail piece, so that the linkage means and movable member are moved hydraulically when the actuator is depressed.

7. (Previously Presented) The device of claim 6, wherein the actuator comprises a thumb button connected to the piston at the remote end of the flexible device.

8. (Original) The device of claim 3, wherein the handle is round so as to be capable of comfortable hand gripping in any rotational orientation.

9. (Currently Amended) A method for applying non-penetrating surgical clips to blood vessels or other wound sites or tissue separation sites where suturing or other wound closure techniques would be difficult, awkward or undesirable, comprising:

providing a hand-held clip applier which includes:

a handle suitable for gripping in the hand of a

surgeon,

a clip storing and dispensing stem extending from a forward end of the handle, the stem having a tip at a remote end, the tip including means for dispensing and serially applying metal clips in non-penetrating engaging configuration against sections of tissue on either side of a wound or tissue separation to clamp the two sections of tissue together, upon the receipt of force to a clip-applying component of the stem,

a movable member within the handle which, when caused to move by a force applied from outside the handle, is effective to cause movement of the clip-applying component in the stem so as to cause dispensing and application of a clip, and

linkage means adjacent to the movable member within the handle and extending to a position in the handle capable of receiving a force from the exterior of the handle, and providing a flexible remote force-transmitting device connected to the handle of the clip applier, the force-transmitting device comprising a tubular sheath, and an internal movable medium capable of delivering a force through the tubular sheath, a remote actuator at a remote end of the flexible device, for applying a force to slide the movable medium through the sheath so as to cause movement of a tailpiece at a proximal end

of the tubular sheath when the actuator is engaged, the sheath at the proximal end being connected to the handle of the hand-held clip applier in a position to apply force to the linkage means in the handle by motion of the tailpiece, thus moving the linkage means and movable member within the handle, and thus advancing the clip-applying component to dispense and apply a clip when the actuator on the flexible force-transmitting device is engaged,

gripping the handle in one hand and manipulating the handle so as to positioning the tip of the clip applier in an appropriate position to connect tissue, and

effecting dispensing and application of a clip at the site to be closed by engaging the remote actuator at the remote end of the flexible device, the engaging of the actuator not being performed by the hand holding the handle of the clip applier.

10. (Previously Presented) The method of claim 9, wherein the actuator is engaged by a person other than the person holding the handle of the clip applier.

11. (Original) The method of claim 9, wherein the actuator comprises a foot pedal and is depressed by the person holding the clip applier.